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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/507,213	02/18/2000	Tinku Acharya	042390.P8350	8186

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EXAMINER	
DO, ANH HONG	

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 04/30/2004 17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/507,213	Applicant(s) ACHARYA ET AL.	
	Examiner ANH H DO	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *30 and 31* is/are allowed.

6)☒ Claim(s) *1-9 and 12-29* is/are rejected.

7)☒ Claim(s) *10 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *16*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-9 and 12-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (U.S. Patent No. 6,560,369) in view of Martucci et al. (U.S. Patent No. 5,764,805).

Regarding claims 1, 2 and 24, Sato discloses:

- applying a process to transform the transformed signal samples from a first domain to a second domain by discrete wavelet transformer 802 (Fig. 8), the transform process comprises an inverse discrete wavelet transformer 605 (Fig. 7) to decompose signal samples into two or more subbands (Fig. 6B);

- during the transform process, filtering quantized signal samples, by first applying scaled filter coefficients, the signal samples first being filtered along the image in a first direction and then along the image in another direction (col. 6, lines 11-22), so that at the completion of the transform process of the image, at least selected regions of the transformed signal samples are inversed quantized using inverse quantizer 603 (Fig. 7).

Sato does not expressly teach the inverse quantization is integrated into the IDWT process.

Martucci discloses the inverse quantization is integrated into the IDWT process (Fig. 1: inverse wavelet generator 112 performs computations of the inverse quantization 130 and the inverse DWT 132).

Sato & Martucci are combinable because they are from image encoding/ decoding process.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to integrate the inverse quantization into the inverse DWT process in Sato as taught by Martucci.

The suggestion/motivation for doing so would have been to facilitate the reconstruction of the image frame (Martucci: col. 5, lines 60-64).

Therefore, it would have been obvious to combine Sato with Martucci to obtain the invention as specified in claims 1, 2, and 24.

Regarding claim 3, Sato teaches the first domain is the spatial domain, the second domain is the frequency domain (col. 5, lines 30-37), the first direction is horizontal direction (i.e., a row-wise) and the second direction is vertical direction (i.e., column-wise) (col. 6, lines 26-37), and IDWT 605 (Fig. 7) for decomposing signal samples into two or more subbands (Fig. 6B).

Regarding claims 17 and 18, Sato discloses:

- an image input apparatus 101 (corresponding to the claimed integrated circuit) having input ports to receive signal samples associated with at least one image (Fig. 4A);

- a digital circuitry applying a process to transform the transformed signal samples from a first domain to a second domain by discrete wavelet transformer 802 (Fig. 8), the transform process comprises an inverse discrete wavelet transformer 605 (Fig. 7) to decompose signal samples into two or more subbands (Fig. 6B);

- during the transform process, filtering quantized signal samples, by first applying scaled filter coefficients, the signal samples first being filtered along the image in a first direction and then along the image in another direction (col. 6, lines 11-22), so that at the completion of the transform process of the image, at least selected regions of the transformed signal samples are inversed quantized using inverse quantizer 603 (Fig. 7).

Sato does not expressly teach the inverse quantization is integrated into the IDWT process.

Martucci discloses the inverse quantization is integrated into the IDWT process (Fig. 1: inverse wavelet generator 112 performs computations of the inverse quantization 130 and the inverse DWT 132).

Sato & Martucci are combinable because they are from image encoding/ decoding process.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to integrate the inverse quantization into the inverse DWT process in Sato as taught by Martucci.

The suggestion/motivation for doing so would have been to facilitate the reconstruction of the image frame (Martucci: col. 5, lines 60-64).

Therefore, it would have been obvious to combine Sato with Martucci to obtain the invention as specified in claims 17 and 18.

Regarding claims 19 and 25, since this claim recites the same subject matters as those in claim 3, the discussion of claim 3 applies hereto.

Regarding claims 4, 12, 20 and 26, Sato teaches a two-dimensional / multidimensional IDWT 605 (Fig. 7).

Regarding claims 5, 21 and 27, Sato teaches decomposition into mutually orthogonal directions, the decomposition being into low pass and high pass subbands (col. 6, lines 11-22). Regarding claims 6 and 7, Sato teaches biorthogonal spline filters comprising 9-7 filters (col. 6, lines 11-22).

Regarding claims 8, 9, 22, 23, 28 and 29, Sato teaches a second level (or kth level) of transformation (col. 7, lines 11-18) and scaling to the LL subband of the transformed image (col. 6, lines 11-22).

Regarding claim 13, Sato teaches the method of quantization is applied to successive video image frames (col. 1, lines 48-54).

Regarding claims 14 and 15, Sato teaches quantizer 803 for truncating and rounding the signal sample values (Fig. 8).

Regarding claim 16, Sato teaches the selected portion of the transformed signal samples comprises an entire image of transformed signal samples (col. 1, lines 48-54).

Allowable Subject Matter

4. Claims 30 and 31 are allowed.

5. Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 10, 11, 30 and 31, the prior art, taken either singly or in combination, does not teach:

- applying the scale factor $1/sqr[Q(LL_k)]$ to each filter coefficient in the low pass / high pass filtering operation over the LL_{k-1} subband to generate subbands LL_k and HL_k;

- applying the scale factor $sqr[Q(LL_k)]/Q(LH_k)$;

- applying the scale factor $Q(HL_k) / Q(HH_k)\, sqr[Q(LL_k)]$.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANH H DO whose telephone number is 703-308-6720. The examiner can normally be reached on 5/4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID K MOORE can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 29, 2004

ANH HONG DO
PRIMARY EXAMINER